

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Application of)
PUBLIC UTILITIES COMMISSION) DOCKET NO. 2008-0273
Instituting a Proceeding to Investigate the)
Implementation of Feed-in Tariffs.)
_____)

**TAWHIRI POWER LLC'S
FINAL STATEMENT OF POSITION REGARDING FEED-IN TARIFF DESIGNS,
POLICIES AND SPECIFIC PRICING PROPOSALS;**

EXHIBIT "A";

AND

CERTIFICATE OF SERVICE

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**TAWHIRI POWER LLC'S
FINAL STATEMENT OF POSITION REGARDING FEED-IN TARIFF DESIGNS,
POLICIES AND SPECIFIC PRICING PROPOSALS**

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF HAWAII:

Pursuant to the Hawaii Public Utilities Commission's (the "Commission") Order Approving The HECO Companies' Proposed Procedural Order, As Amended, filed herein on January 20, 2009 ("Procedural Order"), TAWHIRI POWER LLC ("TPL") hereby submits to the Commission its Final Statement Of Position Regarding Feed-In Tariff Designs, Policies And Specific Pricing Proposals and in response to the Statement Of Issues set forth on pages 8 and 9 of the Procedural Order ("Final Statement of Position"). Additionally, attached hereto as Exhibit "A" and made a part hereof is Dr. Mohamed El-Gasseir's "Proposed Solution for the Curtailment Issue As It Relates to the Unintended Consequences of Project-Based Feed-In Tariffs".

As previously noted by TPL, Dr. El-Gasseir is its consultant with extensive experience and knowledge in regards to: (1) the HECO systems; (2) electric industry restructuring; (3) stranded assets, revenue dynamics and rate stability issues; (4) renewable energy economics; (5) distributed resources planning; (6) self-generation assessment; and (7) integrated resource planning. These areas of expertise are part of the knowledge base essential for consideration of

feed-in tariffs. Furthermore, Dr. El-Gasseir has advised regulatory and planning commissions for the States of California, New York, Connecticut, New Jersey, and Nevada. He has also been engaged by many utilities, including some of the largest investor-owned companies such as Con Edison of New York, Commonwealth Edison of Chicago, Pacific Gas & Electric Company, Detroit Edison, Southern Energy, and British Columbia Hydro (to name a few). Lastly, Dr. El-Gasseir's proposed solution for the curtailment issue reflects experience encompassing virtually every aspect of the design, planning and implementation of Project Based Feed-In Tariffs. Therefore, TPL urges the Commission to seriously consider adoption of the proposal as described in Exhibit "A". Embracing this recommended solution to address the curtailment issue will substantially increase the likelihood of successful design and implementation of an effective Feed-In Tariff Program.

I. INTRODUCTION

The Principals of TPL were partners in the Kamao'a Wind Farm ("Kamao'a") that began wind generation in 1986 located adjacent to TPL's Pakini Nui 21 MW Wind Farm ("Pakini Nui") in the South Point Area of the Big Island. Apollo Energy Corporation, a Hawaii corporation ("Apollo Energy"), operated Kamao'a from 1994 until 2006. During the mid-1990s Apollo Energy began negotiations with Hawaiian Electric Company, Inc. ("HECO" and Hawaii Electric Light Company, Inc. ("HELCO") to extend and amend its existing Power Purchase Agreement in an effort to increase the generating capacity of Kamao'a. Finally, after almost seven (7) years, and hundreds of thousands of dollars, Apollo Energy was able to secure the Power Purchase Agreement under which TPL is operating Pakini.¹

¹ See Docket Nos. 00-0135 and 04-0346 for the herculean efforts required of Apollo Energy to secure the present "Restated And Amended Power Purchase Contract For As-Available Energy" ("RAC") dated October 13, 2004 under which TPL sells its renewable energy to HELCO. After the RAC was approved by the Commission on March

TPL's Pakini Nui began operations on April 3, 2007. Now approaching its second (2nd) anniversary, Pakini Nui provided approximately 7.2 percent of the 2008 electricity needs of the Big Island without releasing any carbon emissions or introducing other fossil-fuel pollutants into Hawaii's pristine environment. TPL considers Pakini Nui the "crown jewel" of wind energy generation on the Big Island since it is capable of producing almost 130 million kilowatt-hours per year of clean energy which is enough to power approximately 12,000 Big Island homes for one year.

Pakini Nui also provides direct economic benefits to the Big Island and its residents because its renewable energy costs less than HELCO's own generation. TPL estimates this has resulted in savings of approximately \$5 Million; money that stayed in Hawaii instead of being siphoned off to other countries for the purchase of foreign oil. Additionally, by being located in an Enterprise Zone, Pakini Nui provided job opportunities for the residents of the District of Ka'u.

As explained in detail by Dr. El-Gasseir, it is imperative the Project-Based Feed-In Tariff mechanism to be considered for adoption by the Commission "**do no harm**" to the economic viability of Pakini Nui and other pre-existing renewable energy generators. In fact, fairness and efficiency require properly designed Feed-In-Tariffs **do no harm** to any prior investment, including projects developed in the future through any renewable energy development program. With respect to Pakini Nui, it is an existing **unsubsidized** renewable energy generator that requires no additional capital expenditures to continue to provide numerous benefits to the residents of the Big Island.

The cost of procuring and transporting fossil fuels to the State of Hawaii is significantly

10, 2005, Apollo Energy assigned the same to its' wholly-owned subsidiary, TPL, for the development of Pakini Nui separate and apart from Kamao'a.

higher than in the case of the mainland states. Moreover, the volatility of oil prices bears substantial economic risks to Hawaii's ratepayers. Therefore, Hawaii's significant renewable energy resources and the increased demand for eco-tourism require focused efforts on shifting to renewable energy generation. In addition, Hawaii's policy makers have already embraced a goal of meeting 40% of the Big Island's electricity demands with renewable generation by 2030. Such action requires a new perspective on how the State may achieve this desired transformation. In doing so, TPL proposes the Commission also raise that goal to a 100-percent renewables-driven economy and direct that the HECO Companies' infrastructures be modified to accommodate as much renewable generation as economically achievable **without harming prior or preceding commitments.**² To efficiently accomplish this end, TPL strongly recommends a pilot approach integrated with a *do no harm* policy to carefully solidify the institutional and regulatory basis for rapid least cost and equitable transformation of the electricity industry of Hawaii.

II. STATEMENT OF ISSUES

Purpose of Project-Based Feed-In Tariffs ("PBFiTs")

1. What, if any, purpose do (sic) PBFiTs play in Meeting Hawaii's clean energy and energy independence goals, given Hawaii's existing renewable energy purchase requirements by utilities?

Response: If properly designed and implemented, PBFiTs will enjoy an integral role in the encouragement and development of renewable energy production in

² TPL's other consultant, Mr. Harrison K. Clark, has reviewed the HECO Companies Responses to the latest Information Requests from the Commission filed on March 18-19, 2009 ("HECO's March Responses"). As summarized by TPL, Mr. Clark concludes HECO's March Responses: (a) are informing the Commission of the shortcomings of the HECO Companies' infrastructures, rather than proposing solutions to their inflexible grids to accommodate renewable generation at an accelerated rate; (b) could have employed existing modeling analysis techniques to arrive at numbers and values to directly answer the questions presented by the Commission; and/or (c) are incomplete because other data and pending projects that were not referenced would provide more useful answers. For a detailed description of Mr. Clark's qualifications, publications, and areas of expertise, please visit www.hkclark.com.

the State of Hawaii, along with those other essential incentives embodied within PURPA, Renewable Portfolio Standards ("RPS") and Net Energy Metering ("NEM")³. PBFiT will provide the certainty needed by developers of renewable energy projects for predictable revenue streams to secure reasonable returns on their investments. However, as previously cautioned by TPL's consultant, Dr. Mohamed El-Gassier, the PBFiT "debates [must be] conducted in full transparency and without compromising the due process requirements for such important public policy proceedings." Response to Question No. 14 in Exhibit "A" attached to Tawhiri Power LLC's Comments To Scoping Paper Appendices A and C (Non-Legal Questions) filed herein on January 26, 2009 ("TPL's Scoping Paper Comments"). Additionally, PBFiTs should first be introduced as a "pilot-program" at the distribution level with the guiding principle that when fully implemented PBFiTs **shall do no harm** to present Independent Power Producers ("IPPs") holding existing contracts with the utilities.⁴

2. What are the potential benefits and adverse consequences of PBFiTs for the utilities, ratepayers and the State of Hawaii?

Response:

PBFiTs could potentially benefit the utilities by enabling them to use distribution-level renewable resources in combination with other renewable energy programs to meet increased RPS goals as mandated by HCEI. However, the utilities' statutory obligation to ensure system reliability and stability will be increasingly challenged as variable-generation PBFiTs proliferate within each island's power grid.⁵ Inevitably, curtailment of subtransmission and transmission-level renewable generation becomes unavoidable. Curtailing renewable generation in favor of higher cost fossil generation is being practiced today.⁶ Without designing and instituting adequate remedies, PBFiTs development will eventually lead to significant declines in renewable energy deliveries from lower cost sources to account for higher cost generation. Additionally, without fair compensation for curtailed energy, the FiT will do unintended harm by discriminating between curtailable and uncurtailable renewable energy generators. Such avoidable action will result in costly lawsuits, glaring economic inefficiencies, unjustified rate increases, and cost shifting between low and high-voltage ratepayer classes.

³ Contrary to the position taken by HECO, HELCO, and Maui Electric Company, Limited ("HECO Companies") at the Conference and the applicable provision of the Hawaii Clean Energy Initiative Agreement ("HCEI"), TPL maintains NEM is an essential element to achieve the renewable energy generation goals of HCEI.

⁴ See also Exhibit "A" attached hereto.

⁵ See generally HECO Companies' Response to PUC-IR-1.

⁶ *Id.* at Response to PUC-IR-6.

PBFiTs will permit ratepayers to progressively keep more of the dollars they spend on electricity in Hawaii as the need for importing fuels diminishes. The multiplier effect of that consequence would lead to job creation opportunities and improve Hawaii's overall economy. Additionally, renewable energy generation will reduce the production of greenhouse gases and other harmful byproducts associated with the burning of fossil fuels to generate electricity.

While contemplating the best design for PBFiTs, however, Dr. El-Gasseir cautions an "overly ambitious schedule is simply unrealistic and irrational. [While TPL] supports the establishment of feed-in tariffs for promoting renewable energy growth in Hawaii, . . . instituting PBFiTs to increase renewables' share of electricity generation at a high pace of development represents a monumental paradigm shift that cannot be rushed through the proposed schedule[.]" Response to Question No. 5 in Exhibit "A" attached to TPL's Scoping Paper Comments [emphasis in original].

3. Why is or is not the PBFiT the superior methodology to meet Hawaii's clean energy and energy independence goals?

Response:

As stated in TPL's Scoping Paper, PBFiTs are NOT superior to other methods for requiring utilities to purchase renewable electricity. Id. at Response to Question No. 6. First, PBFiTs may lead to feed-in tariff energy being possibly more expensive than the utilities' avoided costs, at least initially. Second, without proper mitigation of the financial impacts of the curtailment of IPP energy deliveries, PBFiTs will undermine the viability of existing generators, degrade their property values and possibly force some projects to be abandoned. However, if a PBFiT program is designed from the outset to do no harm to projects developed under PURPA, RPS and NEM mechanisms, PBFiTs will accelerate renewable generation development to achieve Hawaii's clean energy and energy independence goals at an acceptable cost.

Legal Issues

4. What, if any, modifications are prudent or necessary to existing federal or state laws, rules, regulations or other requirements to remove any barriers or to facilitate the implementation of a feed-in tariff not based on avoided costs?

Response:

First, there are no barriers imposed by PURPA to implementation of PBFiTs because the United States Supreme Court has previously declined to overrule a decision by the New York Court of Appeals that upheld a New York State Law that required utilities to purchase power at a rate that

exceeded avoided costs. See Consolidated Edison Co. of New York, Inc. v. Public Service Com'n of State, 63 N.Y. 2d424, 483 N.Y.S. 2d 153 (1984), *appeal dismissed*, Consolidated Edison Company of New York, Inc. v. Public Service Commission of New, 470 U.S. 1075, 105 S.Ct. 1831 (1985) [Appeal dismissed for want of a substantial federal question]. Footnote 8 of the New York Court of Appeals decision recognized that

FERC left the States free to utilize their own means of encouraging alternate energy production, stating: "The Commission has become aware that several States have enacted legislation requiring electric utilities in that State to purchase the electrical output of facilities * * * at rates which may differ from the rates required under the Commission's rules implementing section 210 of PURPA. "This Commission has set the rate for purchases at a level which it believes appropriate to encourage cogeneration and small power production, as required by section 210 of PURPA. While the rules prescribed under section 210 of PURPA are subject to the statutory parameters, **the States are free, under their own authority, to enact laws or regulations providing for rates which would result in even greater encouragement of these technologies.** However, State laws or regulations which would provide rates lower than the federal standards would fail to provide the requisite encouragement to these technologies, and must yield to federal Law. "If a State program were to provide that electric utilities must purchase power from certain types of facilities, among which are included 'qualifying facilities,' at a rate higher than that provided by these rules, a qualifying facility might seek to obtain the benefits of that State program. In such a case, however, **the higher rates would be based on State authority to establish such rates, and not on the Commission rules.** * * * "The Commission finds no inconsistency in a facility's taking advantage of section 210 in order to obtain one of its benefits, while relying on other authority under which to buy from or sell to a utility." (Preamble to FERC Rules, 45 Fed Reg 12214, 12221-12222.) Hence, it appears no modifications to existing federal laws, rules, regulations or other requirements are needed.

63 N.Y.2d at 437 [Emphasis added].

Based upon the above, no amendments will be required to the applicable federal laws, rules, or regulations.

With respect to state laws, HRS § 269-27.2(c) requires that “the [C]ommission shall establish that the rate for purchase of electricity by a public utility shall not be more than one hundred per cent of the cost avoided by the utility when the utility purchases the electrical energy rather than producing the electrical energy.” [Emphasis added]. Therefore, TPL recommends the current language of HRS § 269-27.2(c) should be amended to permit the Commission to approve and adopt PBFiT’s payment rates that may exceed the utility’s avoided cost.

5. What evidence must the commission consider in establishing a feed-in tariff and has that evidence been presented in this investigation?

Response: According to Chapter 6-61 of the Hawaii Administrative Rules (“HAR”), the Hawaii Rules of Evidence does NOT apply to the proceedings in this Docket. Instead, the Commission is only constrained “by considerations of relevancy, materiality, and repetition by the rules of privilege recognized by law, and with a view to doing substantial justice. HAR § 6-61-43. Therefore, prepared testimony (HAR § 6-61-45), documentary evidence (HAR § 6-61-46), official records (HAR § 6-61-47), official notice of facts (HAR § 6-61-48), and additional evidence (HAR § 6-61-49), may be received by the Commission.

With respect to the inquiry whether such evidence has already been presented in this Docket in order for the Commission to establish PBFiT’s, TPL is unequivocally of the opinion the record is incomplete to support the same, especially because PBFiT’s will have far-reaching implications which would adversely and irreversibly affect the renewable energy landscape if not properly introduced and appropriate remedies not implemented. Therefore, the Commission is urged to set a contested case hearing to ensure complete transparency and protect the due process rights of all parties involved in this Docket.

Role of Other Methodologies

6. What role do other methodologies for the utility to acquire renewable energy play with and without a PBFiT, including but not limited to power purchase contracts, competitive bidding, avoided cost offerings and net metering?

Response: As previously stated and set forth in TPL’s Scoping Paper, PURPA, RPS, NEM, *Power Purchase Contracts* (“PPAs”), and other methodologies, should all be considered and encouraged to secure renewable energy generation to meet Hawaii’s clean energy and energy independence goals

at the lowest cost to ratepayers. Therefore, PBFiT is only one (1) of several programs which private sector developers and entrepreneurs may select to fulfill their investment goals.

Given the relatively limited loads of the Islands (in particular Maui and the Big Island), the abundance of variable generation resources, and the inflexibilities of generation and transmission systems ill-designed to host significant levels of such resources, introducing PBFiTs at any voltage level will result in utility curtailment of production and delivery of renewable generation from IPPs.⁷ An unacceptable consequence of the aforesaid would be the closings of existing IPP facilities, project abandonments and a general reluctance to invest in new IPP generation outside of the approved PBFiT program. Preventing these unintended consequences requires the Commission to develop and enforce a rule requiring compensation for all curtailed generation at rates no less than the host utility's short-run avoided costs.

Best design for a PBFiT or alternative method

7. What is the best design, including the cost basis, for PBFiTs or other alternative feed-in tariffs to accelerate and increase the development of Hawaii's renewable energy resources and their integration in the utility system?

Response: The "best design" for PBFiTs can be assured through the following 5-step approach:

- i. Commence PBFiT implementation as a "pilot program" at the distribution level beginning with market-proven renewable generation technologies.
- ii. Require all curtailed energy deliveries be compensated at rates no less than the host-utility's short-run avoided costs regardless of whether the generator is a PBFiT seller or an IPP.
- iii. Prohibit the utilities, and their subsidiaries and affiliates, from competing for any form of on-site (customer-based) generation, distributed generation or PBFiT investments because of irreconcilable conflicts of interest.⁸ Eliminating even the appearance of a conflict of interest during the infancy phase of the PBFiT is essential to a proper and objective evaluation of the pilot program while assuring a high level of integrity. This restriction will increase the confidence of ratepayers in the PBFiT Program as they prepare to shoulder the

⁷ See generally HECO Companies' Response to PUC-IR-6.

⁸ Based upon the representations made by the HECO Companies at the Conference, it appears they are agreeable to this restriction.

burden of furthering Hawaii's clean energy and energy independence goals in the present tumultuous economic environment.

- iv. Conduct a thorough and fully transparent evaluation of the potential direct and indirect impacts on ratepayers under this "pilot program". As suggested by many of the Intervenors in this Docket, a 2-year period of review would be adequate to conduct an assessment of the cost of operations of PBFiTs and whether their owners are anticipated to receive reasonable returns on their investments over the anticipated useful life of their projects based upon preliminary revenue and operational results.
- v. Direct Hawaii's utilities to prepare short and long-term plans for upgrading their generation, transmission and distribution systems to maximize the integration of variable and other forms of renewable generation resources while minimizing the need to curtail them. The costs of these plans would be juxtaposed against the costs of compensating PBFiT and IPP generators for curtailed (undelivered) energy. The results from this analysis and the proposed "pilot program" would enable the Commission to determine the optimal balance between PBFiT growth and utility investments in grid upgrades.

Eligibility Requirements

- 8. What renewable energy projects should be eligible for which renewable electricity purchase methods or individual tariffs and when?

Response:

PBFiTs should begin with market-proven technologies on a pilot-basis at the distribution level. Contemporaneously therewith, IPPs with existing PPAs should be permitted to elect to participate as PBFiTs or maintain operations under their PPAs. It is imperative that the Commission provide the renewable energy community with a range of compensation choices for their generation purchased by the utilities. Additionally, IPPs bearing the brunt of load erosion and expanding curtailment practice should be protected from income losses as a result thereof. As set forth in this Final Position Statement, the only fair and readily acceptable solution is to ensure compensation for all curtailed energy deliveries at rates no less than the short-run avoided costs of the host utility.

Analysis of the cost to consumers and appropriateness of caps

9. What is the cost to consumers and others of the proposed feed-in tariffs?

Response: As TPL understands PBFiTs, the tariff rate may initially be more than the utilities' avoided costs. However, over the term of the PBFiT Agreements, the cost to the ratepayer is estimated to be only slightly more than without PBFiTs. Therefore, the consumer would be only paying a slight premium for their energy consumption to encourage the laudable goals of clean energy and energy independence for Hawaii.

As currently proposed by the HECO Companies and Consumer Advocate, the addition of new generation triggers curtailment of existing energy deliveries. Therefore, the costs associated with such curtailment would be paid by: (i) curtailable generators, whether PBFiTs and IPPs with PPAs; and (ii) ratepayers foregoing cheaper IPP electricity to account for higher cost utility generation. A decline in the contribution of transmission-level IPPs because of that increasing encroachment by curtailment will deprive consumers of the benefits of economies of scale and competition. Consequently, to maintain the focus on Hawaii's clean energy and energy independence goals, curtailed entities should be compensated for lost energy production at rates that will ensure revenue neutrality for the generator.⁹

10. Should the commission impose caps based upon those financial effects, technical limitations or other reasons on the total amount purchased through any mechanism or tariff?

Response: Yes. As suggested in TPL's Scoping Paper, the Commission should set an initial cap for each utility equal to next year's forecasted increase in electricity demand (in kW) plus an adequate reserve margin adder if needed. (If a pilot project is implemented, the initial cap can be less than the projected load growth.). The total cap should be updated downward to account for projects entering the queue and upward for projects exiting it. The total cap should be updated once a year by accounting for subsequent years' demand growth.

Procedural Issues

11. What process should the commission implement for evaluating, determining and updating renewable energy purchased power mechanisms or tariffs?

⁹ See attached Exhibit "A".

Response:

TPL recommends what many of the Intervenors in this Docket have already suggested; a review period every two (2) years would be adequate. During this review period, the PBFiT owners would be encouraged by the Commission to submit quarterly reports on their respective projects to determine whether the stated tariff rates should be increased or decreased to continue the development of additional PBFiTs. Such information is contemplated to be submitted to the Commission under protective order to maintain its confidentiality. Thereafter, that information would be analyzed to publish updated tariff rates for subsequent PBFiTs.

The Commission should also be mindful of the impacts of instituting a PBFiTs program, even at a pilot level, on other purchase power mechanisms. In particular, TPL urges the Commission to establish a review process to monitor and evaluate three (3) key elements that link all arenas of power supply, namely: (i) energy delivery curtailment (magnitudes, durations, frequency, timings for each affected generator); (ii) utility short-run avoided costs (evaluation methodology, software and data adequacy, forecasting transparency and resultant trends); and (iii) utility progress in the betterment of its grid agility for integrating variable generation at high penetration rates. Such process is indispensable if Hawaii is to be successful in its efforts to shift to renewable generation at the stated scale and pace of development set forth in the HCEI.

12. What are the administrative impacts to the commission and the parties of the proposed approach?

Response:

Assuming the PBFiTs review period is every two (2) years, the Commission's staff workload would increase during the data submittal and review phases. Further, also assuming the PBFiTs owners submit quarterly reports to the Commission, their workload reporting requirements would increase accordingly.

Respectfully submitted.

DATED: Honolulu, Hawaii, March 30, 2009.


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Proposed Solution for the Curtailment Issue

Prepared on Behalf of Tawhiri Power, LLC

By Mohamed M. El-Gasseir, Ph.D.

For the

Feed-in Tariff Proceeding

March 30, 2009

Exhibit "A"

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Proposed Solution for the Curtailment Issue As It Relates to the Unintended Consequences of Project-Based Feed-In Tariffs

Mohamed M. El-Gasseir, Ph.D.

March 30, 2009

A utility may curtail renewable energy deliveries (and hence production) when its generation and/or transmission systems are not sufficiently flexible to accommodate all of the energy produced. The practice of curtailing generators is already a common occurrence in Hawaii, and the losses for independent power producers (IPPs) and ratepayers have been substantial. Without an effective solution to this problem the situation will worsen significantly given the relatively small size of Hawaii's electric power systems, the abundance of renewable resources in the islands, and the intent of policymakers to encourage significant growth of renewable generation through several mechanisms such as establishing a Feed-in Tariff (FiT). Current proposals to deal with the curtailment issue emanate from a perspective that views renewable resources as the disruptors that must be penalized for intruding on the operation of oil-fired generators. This paper addresses the issue by taking a viewpoint more in line with a public policy that aims at transitioning Hawaii to an economy and a civilization fueled entirely by renewable energy resources. The perspective use views renewables as the resources to be accommodated and the current infrastructure as the system that must be restructured as soon as possible. More specifically, the paper:

1. Highlights the consequences of continuing to force generators to cut down production without adequate compensation for revenue erosion; and
2. Proposes a solution to the problem that effectively deals with the causes and the consequences of curtailing power deliveries.

1. The Consequences of Curtailing Renewable Energy Production

This practice, which is bound to increase if the growth of the renewables sector is not accompanied with adequate investment in the betterment of the HECO systems, will result in a number of unintended negative consequences, including:

- Assured revenue-erosion for renewable energy developers;
- Project failures;
- Inefficient Feed-in-Tariff (FiT) pricing;
- Discrimination among renewable generators and between renewables and fossil-fired facilities;
- Cumbersome processes for prioritizing and enforcing curtailment;

- Slowing down of the shift from fossil-fired generation; and
- Suppressing system betterment to facilitate absorbing more renewable.

1.1 Revenue Erosion

Under the HECO-proposed FiT schedule, generators will not be paid for curtailed energy. The consequent risk of revenue erosion will be marked by:

- A rising trend for any individual renewable energy generator; and
- Expanding domain.

The increasing risk trend will be an inescapable conclusion if generators are subjected to curtailment without compensation and the State of Hawaii continued to pursue even moderate development of renewable resources through FiT and other mechanisms without aggressive investment in system upgrades. Moreover, because of uncertainties inherent in the timing and impacts of utility infrastructure investments, the risk of future mitigation of revenue erosion will not be easily predictable for project financing purposes. This result will increase the cost of capital for renewable energy developers.

Because a utility cannot and should not discriminate among independent power producers (IPPs), an increasing trend in the need to curtail IPP energy deliveries to the system is bound to expand the domain of revenue erosion to include firm energy resources in addition to intermittent (variable) generators. In a system where seniority rules have to be enforced to protect pre-existing investments, geothermal and biomass fueled facilities may very well be curtailed in advance of variable resources. Even curtailable solar-powered generators may not escape revenue erosion when IPP, distributed resources, self-generation and non-curtailable FiT energy reach high penetration levels.

1.2 Project Failures

With revenue erosion there will be the risk of project failures. Some of this might take place early on as developers fail to secure affordable financing for proposed investments. In other cases a facility might be forced to close down if the reduction in revenues due to curtailment forces the owner into financial default.

1.3 Inefficient FiT Pricing

The prospect of revenue erosion will force developers to demand higher contract prices. If the Public Utilities Commission (PUC) ignores such demands, revenue erosion will continue and may even intensify, leading to the consequences discussed earlier. PUC approval of increased FiT prices could easily lead to overly determined prices or severely understated values. Either way, the adopted prices are likely to be inefficient since they will not diminish the incidence of curtailment.

1.4 Discrimination Among Generators

Lack of communication and control systems (due to cost and other factor) may prevent curtailment of generation interconnected at the distribution level or delivered on the customer side of the meter. Such facilities would continue operating in spite of their contributions to the need to curtail production and delivery of IPP generation because of system inflexibilities. This in turn means disproportional curtailment of renewable energy deliveries at the subtransmission and transmission levels. The resultant discrimination can be the basis for legal challenges that could slow down or even end FiT development efforts in Hawaii.

Curtailling IPP generation without fair compensation could also lead to another form of discrimination: one between the HECO operating companies and the generators delivering energy to consumers through the transmission and distribution systems of Oahu, Maui and the Big Island. The HECO utilities are currently seeking PUC approval of decoupling their revenue requirements from retail sales. If successful, this change in the ratemaking process will enable each operating company to recover its target revenue requirements irrespective of the amount of generation actually delivered to its customers. An IPP can achieve similar protection against revenue erosion if it were assured of a steady level of earnings regardless of the level of curtailment it had to endure. Guaranteeing revenue recovery for the utilities while exposing renewable energy developers to curtailed deliveries is clearly as blatant a form of discrimination as can be.

1.5 Problems with Seniority Rules

Until the HECO companies implement the upgrades needed to minimize the inflexibilities of their generating and transmission systems that prevent unhindered accommodation of renewable generation, the magnitude and frequency of curtailed energy deliveries will continue to increase as more generation comes on line and/or more loads are lost to self-generation, conservation and load management. Thus, with every entry by a new generating facility, existing IPPs will face increased risk of revenue erosion. Without monetary compensation in one form or another, the only method that can be used to minimize the unintended harm is the enforcement of a preferential treatment in the allocation the needed level of energy delivery curtailment on the basis of temporal seniority. In other words, the newer facilities would have to be curtailed first and oldest ones curtailed last. Pre-existing investments have a rightful expectation of do-no-harm. Moreover, no one should expect an already committed investor to shoulder the revenue erosion of future developers.

Although it is unquestionably necessary in the absence of adequate compensation for lost IPP revenues, allocating curtailment by seniority is no easy task, often contestable and can be inefficient. Determining which project is more senior requires developing and implementing rules and procedures in a totally transparent manner. (It should be noted here that from TPL's perspective HELCO's management of the curtailment queue in the Big Island has so far been very discouraging.) As the IPP/FiT sector expands, the burden of processing seniority schedules and adjudicating complaints and counter-complaints could grow to unmanageable levels for the utilities, the PUC and the IPP community; adding significantly to the transactions cost of Hawaii's transition to a renewables electricity economy.

The question of efficiency extends beyond process and adjudication costs. If the PUC were to settle on minimizing harm to pre-existing investments by applying seniority rules rather than compensating generators for curtailed energy, the utilities will not be able to determine who to curtail on purely system reliability and security grounds. When generators are assured of full compensation for lost revenues, they should be indifferent to how much and how often they could be curtailed. Seniority becomes irrelevant. The operating company will have free reign in determining the most effective (technically and cost wise) curtailment plan, including identifying the set of generators whose energy deliveries should be reduced. Such operational planning flexibility is good for maintaining system reliability and grid security within acceptable performance criteria. It also improves the long-term planning process as the HECO companies start to move seriously in the direction of upgrading their generation and transmission systems to maximize the ability of their grids to absorb renewable generation.

1.6 Slowing Down of the Shift from Fossil-Fired Generation

Business-as-usual curtailment will slow down the transition away from fossil fuels in two ways. First, there is the fact that any time a HECO utility decides to reduce deliveries from a renewable resource it means the substitute has to be oil-fired generation. There is nothing in the business-as-usual approach that could change this practice. Relying on seniority rules to lessen the pain will only prolong a bad approach that should not be used; namely, curtailing renewable generation without compensation. Second, system dynamics and substantial declines in oil prices could in fact increase the magnitude and frequency of the curtailment of renewable generation above and beyond what one would expect from the addition of a known amount of variable (intermittent) generation. This phenomenon appears to be supported by recent experience (since 2007) on the Big Island, where there is evidence of a growing retreat from wind power to make room for more generation from HELCO's facilities. The net result: increased release of pollutants and greenhouse gases, higher operating costs for HELCO's customers and financial stresses on IPPs.

1.7 Suppression of System Betterment to Absorb More Renewables

The high cost of importing fossil fuels and the abundance of renewable energy resources place Hawaii in a unique position to be the first developed economic zone powered entirely by renewable energy. The obstacles slowing down the realization of such future are rooted in an electricity infrastructure designed for a fossil-fired electricity industry and the inertia of the status quo. If public policy is seriously seeking high reliance on renewables then the impasse has to be broken. Curtailing IPP generators without compensation hides the costs of the inflexibility of the electricity generation and transmission infrastructures. Even if HECO moves beyond the talking stage with respect to upgrading the systems of its operating companies, the results will not be as effective as they should be as long as curtailment without compensation continues to be practiced.

2. Solution Principles

The solution we propose to deal with the curtailment issue and associated problems is based the following seven principles:

- A Do-No-Harm FiT;
- Ensure revenue neutrality;
- Establish the zero-curtailment price;
- Determine the revenue-neutral prices;
- Adopt FiT price-curtailment schedules;
- Pay prices at the expected curtailment levels; and
- Use balancing accounts for periodic settlements.

2.1 Do-No-Harm FiT

A successful feed-in tariff should facilitate the growth of renewable generation without harming prior investments. Attractive prices and a streamlined subscription process should encourage investors to seriously consider participating in the adopted FiT. Embracing a Do-No-Harm principle should seal their participation as investors realize that the risk of revenue erosion would be minimal. The commitment to safeguard prior investments should also ensure the continued contribution of operating renewable generators to Hawaii's need for clean energy.

2.2 Ensure Revenue Neutrality

The only way to ensuring that the adopted tariff would do no harm to any generator – regardless of the type of renewable development program it belongs to or the vintage of the facility – is to guarantee revenue neutrality irrespective of the level of curtailment the generator experiences.

2.3 Establish the Zero-Curtailment Price

A base price, symbolized by P_0 , is the FiT rate of compensation for a facility that is presumed to be generating and delivering electricity to the grid without being curtailed by the purchasing utility (i.e., assuming zero curtailment). This rate is the very same prices that the PUC is contemplating to adopt for each category and size class to be considered eligible for FiT enrollment. The P_0 values to be adopted will be presumably based on the recommendations emerging from Docket No. 2008-0273 and the PUC's own inquiries. To assure correct information on how to set the base prices, it is important that the Commission makes it clear to all concerned that:

1. It intends to consider compensating generators for curtailed energy; and
2. The submitted estimates of P_0 values should assume zero curtailment risk.

Without such assertion, the quality of the submitted pricing information is highly suspect.

2.4 Determine the Revenue-Neutral Prices

This principle requires that the settlement price be proportional to the level of curtailment experienced. It follows then that compensation price is determined by:

$$P_c = \frac{P_0}{1 - FPCL} \quad (1)$$

Where

FPCL = Fraction of Power Curtailment Level

Equation 1 can be made part of every purchase power agreement (PPA) along with the adopted P_0 value.

2.5 Adopt FiT Price-Curtailment Schedules

For every PPA, there should be a schedule showing the series of compensation prices that would be paid for delivered energy at predetermined levels of curtailed deliveries. Each series P_c values would have to be calculated using Equation 1 and the applicable base price P_0 . The underlying P_c values could be set at cumulative levels of curtailment increasing by intervals of 10%, 25% or some other values.

2.6 Pay Prices at Expected Curtailment Levels

Because data for final settlements may take time to be processed and validated, the purchasing utility should inform the seller ahead of time of the level of curtailment in the PPA schedule that it expects to enforce for system protection purposes. Settlement and compensation will be initially performed on the basis of the P_c value corresponding to the nominated curtailment level and the metered energy deliveries.

2.7 Use Balancing Accounts for Periodic Settlements

Because the actual level of curtailment is very likely to differ from the nominated amount, a reconciliation mechanism is necessary. This can be achieved by establishing a balancing account for each PPA contract to credit or debit the generator for under/over estimation of expected curtailment. This approach is very much the same as the method that utilities commonly use to update and settle various running revenue accounts.

3. Illustration

The following example should illustrate the application of the proposed solution:

- A. Assume a base (zero-curtailment) price, P_0 , of \$0.2/kWh for a particular generator.
- B. Apply the revenue-neutrality principle by using Equation 1 to establish the following – example – pricing schedule at 10% intervals of curtailment for said generator:

| Curtailment Level | 0.0% | 20% | 40% | 60% | 80% |
|--|-------------|-------------|-------------|-------------|------------|
| Compensation Price, P_c (\$/kWh) | 0.20 | 0.25 | 0.33 | 0.50 | 1.0 |

- C. Assume the utility expects a need to curtail deliveries from several generators by significant amounts. Further assume that the utility determines that it makes technical and economic sense to curtail as much as 40% of the production of the generator of interest to meet its reliability and system protection requirements.
- D. The utility then informs the generator of its intention to curtail 40% of its otherwise deliverable generation and that the compensation price for all delivered energy would be \$0.33/kWh (on the basis of above hypothetical schedule).
- E. After metered data is validated and finalized, the utility established (with the help of the generator) that the amount actually curtailed is 50%. Applying Equation 1, the correct P_c value would then be \$0.40/kWh, and the generator's balancing account would be credited with the difference accordingly.

4. Rationale

There are four reasons for adopting the proposed solution:

- It does away with the curtailment problems discussed earlier;
- It reveals system inflexibility costs;
- It meets the fairness criterion; and
- It ends a wrongful policy of penalizing variable (intermittent) resources.

4.1 Elimination of All Curtailment Problems

The root cause of the curtailment problems is the prospect of loss of earnings by generators who invested or may invest substantial moneys and efforts in expectation of selling all that can be produced by their facilities to the HECO utilities. Remove this threat and every one of the consequences discussed above goes away. The elimination of curtailment problems generates additional dividends. For example:

- The abolition of the risk of revenue erosion will lead to cheaper financing for future projects.
- Avoidance of project defaults (because price certainty will be coupled with guaranteed cost recovery) will translate into more effective FiT and other renewable development programs.
- FiT pricing will be more efficient than would have been the case because project developers would not need to guess how much curtailment and revenue erosion they would be facing (so that they could figure out the FiT contract price increases to lobby for). Likewise, the PUC would not need to forecast curtailment trends for the purpose of internalizing potential revenue losses into future FiT rates of compensation. FiT pricing would be based solely on information on parameters far less uncertain than curtailment levels, frequencies and timings (e.g., scheduled maintenance and well-known patterns of forced outages).
- There will be no discrimination between curtailable generators (interconnected primarily at the transmission and subtransmission levels) and non-curtailable generators (mostly on the distribution system) since both will be guaranteed revenue recovery. This means less risk of costly FiT court challenges that may lead to a public backlash and delay the transition to a fully renewables future.
- There will be no need to manage controversial curtailment queues as the primary reason for disputes (i.e., potential revenue losses) will no longer be relevant. Eliminating a queue restriction based on project seniorities is likely to improve system dispatch and operation significantly during low-load hours. This in turn leads to more efficient FiT and other renewables programs.

4.2 Shedding Light on the Cost of System Inflexibility

As stated before, the proper perspective for policy making purposes is to view Hawaii as a renewables economy zone. This means that the cause of the need to curtail renewable generation is the current inflexibility of the Islands' grids rather than the intermittent nature of the State's natural resources. Viewed from this perspective, the logical question that must be then asked is:

What does the system's inflexibility cost ratepayers when curtailment of renewable energy deliveries is invoked?

Setting aside the costs associated with environmental, health, and economic security issues, the answer to this query can be gleaned from the following formula:

$$\text{System Inflexibility Costs} = \text{Energy Avoided Costs} \times \left[1 - \frac{P_0}{P_c} \right] \quad (2)$$

Equation 2, which has been derived by considering the cost of the replacement energy that has to be used to substitute for the renewable generation deliveries to be curtailed, bears a number of important messages:

- System inflexibility will cost Hawaii an amount above and beyond the cost of the renewable energy that has to be wasted;
- The cost of the inflexibility is a function of the avoided cost of energy of the utility **and** the ratio of the prices of renewable energy with and without curtailment;
- System inflexibility costs can be totally eliminated when the value of P_c is minimized to where it becomes equal to P_0 ; reducing the right-hand side of Equation 2 to eventually zero). This will happen only when sellers are no longer curtailed; and
- As an IPP plant is progressively forced to totally shut down, the value of P_c becomes increasingly very large, rendering – in the end – the cost of the inflexibility of the system asymptotically equal to the incremental cost of production from the utility's own generating facilities.

Compensating generators for curtailed deliveries makes the incentive to improve system agility “clear and present”.

4.3 Meeting the Fairness Criterion

Any regulation or ruling must by definition be fair to all concerned parties. Requiring that IPP generators are compensated for curtailed energy deliveries amounts to asking for security of earnings by decoupling revenue collection from energy sales. This requirement does not differ from what the HECO companies are seeking to establish in the Decoupling proceeding (Docket No. 2008-0274). Fairness requires equal treatment by the PUC. Investors in existing and future renewable energy are entitled to the same degree of protection afforded to HECO's shareholders. The proposed solution meets this criterion.

4.4 Elimination of Penalizing Variable (Intermittent) Resources

In its recent landmark decision to allow rolling the costs of trunkline transmission systems for wind generation into the rate base of investor-owned utilities, the Federal Energy Regulatory Commission (FERC) recognized among other considerations the need to end the penalization of intermittent resources because of locational constraints and their dispersed nature.¹ The FERC decision has set a precedent for ending discrimination against renewable resources in regulatory arenas. Allowing full recovery of revenue-requirements for oil-fired plants (which have to be maintained running at minimum load during off-peak periods) while curtailing renewable generators without due compensation clearly amounts to penalization of the latter. Paying IPPs for energy production irrespective of the extent of the delivery curtailments forced on them ends a blatant form of penalizing variable generation resources.

¹ Federal Energy Regulatory Commission, Order on Petition for Declaratory Order, FERC Docket No. EL05-80-000, July 1, 2005.

5. Conclusion

Ending generators' exposure to the revenue erosion risks associated with utility-invoked curtailment of energy deliveries will achieve:

- Avoidance of unnecessarily high financing costs;
- Efficient FiT pricing;
- Minimization of project defaults;
- Reduction in legal challenges;
- Reduction of administrative costs;
- Proper perspective of renewable resources as the generation base that the current system must accommodate; and
- Encouragement of investing in system betterment to minimize grid inflexibilities.

These achievements will have a combined effect of assuring a rapid transition towards a fully renewables-electricity future for Hawaii in a systematic and least-cost manner.

CERTIFICATE OF SERVICE

The foregoing Opening Statement Of Position was served on the date of filing by hand delivery or electronically transmitted to each such Party.

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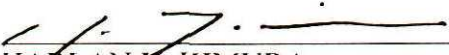
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